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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/572,595	10/24/2006	Keiichi Yano	287530U/SOX PCT	2913
22850 7590 01/26/2010 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER LL MEIYA				
ART UNIT 2811		PAPER NUMBER		
NOTIFICATION DATE 01/26/2010		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/572,595

**Applicant(s)**

YANO, KEIICHI

**Examiner**

MEIYA LI

**Art Unit**

2811

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 October 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-7 and 9-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-7 and 9-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/GS/US)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1, 3-7 and 9-11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no support in the specification for the claim limitations of "the co-fired aluminum nitride substrate has a thickness of 0.3 to 0.6 mm" as recited in claim 1; instead the thickness of co-fired aluminum nitride substrate listed in Table 1 is either 0.3 mm or 0.6 mm.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1, 3-7 and 9-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. The claimed limitation of "the light emitting device comprises a vapor-deposited metal film and via holes, ..., the via holes penetrating the co-fired aluminum nitride substrate from the front surface, ..., to the rear surface of the co-fired aluminum nitride substrate ...", as recited in claim 1, is unclear as how the via holes can penetrate the co-

fired aluminum nitride substrate from the front surface to the rear surface when the via holes of the light emitting device are arranged on the front surface of the co-fired aluminum nitride substrate.

***Claim Rejections - 35 USC § 103***

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
7. Claims 1, 4, 5, 9-11, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsing Chen et al. (2004/0188696) in view of Hikasa et al. (5,770,821) and Lee et al. (2004/0262738).

As for claim 1, Hsing Chen et al. show in Fig. in Figs. 12, 1E and related text a white-light emitting apparatus comprising:

an aluminum nitride substrate 1010 ([0037, lines 5-6]; and

a light emitting device 1024 arranged on a front surface 16 of the aluminum nitride substrate,

wherein the light emitting device comprises a vapor-deposited metal film 50 and via holes 1014, the vapor-deposited metal film being arranged on the front surface of the substrate around the light emitting device, and the via holes penetrating the substrate from the front surface, on which the light emitting device is arranged, to the rear surface of the substrate to thereby allow conduction to the light emitting device from the rear surface.

Regarding the process limitations ("co-fired", "vapor-deposited"), these would not carry patentable weight in this claim drawn to a structure, because distinct structure is not necessarily produced.

Note that a "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and *In re Marosi et al.*, 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that the applicant has the burden of proof in such cases, as the above case law makes clear.

Hsing Chen et al. do not disclose that the substrate is a co-fired aluminum nitride, and the front surface of the co-fired aluminum nitride substrate is mirror-polished so as to have a surface roughness of 0.3  $\mu\text{m}$  Ra or less; the vapor-deposited metal film having a reflectivity of 90% or more with respect to light emitted from the light emitting device; wherein the vapor-deposited metal film comprises aluminum or silver and has a thickness of 1 to 5  $\mu\text{m}$ ; and the co-fired aluminum nitride substrate has a thickness of 0.3 to 0.6 mm.

Hikasa et al. teach in Fig. 3 and related text a co-fired aluminum nitride substrate 1, a surface 1a thereof is mirror-polished so as to have a surface roughness of 0.3  $\mu\text{m}$

Ra or less (Col. 5, lines 6-7; Col. 8, lines 51-55), wherein the co-fired aluminum nitride substrate has a thickness.

Lee et al. teach the vapor-deposited metal film having a reflectivity of 90% or more with respect to light emitted from the light emitting device; wherein the vapor-deposited metal film comprises aluminum or silver (claim 4).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to include the mirror-polished co-fired aluminum nitride substrate with the surface roughness of 0.3  $\mu\text{m}$  Ra or less, as taught by Hikasa et al., the vapor-deposited metal film having a reflectivity of 90% or more with respect to light emitted from the light emitting device; wherein the vapor-deposited metal film comprises aluminum or silver, as taught by Lee et al., the thickness of co-fired aluminum nitride is 0.3 to 0.6 mm; and the vapor-deposited metal film has a thickness of 1 to 5  $\mu\text{m}$ , in Hsing Chen et al.'s device, in order to improve the thermal conductivity and the mechanical strength of the device, the reflectivity of the device, and the performance of the device, respectively. Furthermore, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. Moreover, it has been held that where then general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Furthermore, it has been held in that the applicant must show that a particular range is critical, generally by showing that the claimed range achieves unexpected

results relative to the prior art range. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). Note that the law is replete with cases in which when the mere difference between the claimed invention and the prior art is some dimensional limitation or other variable within the claims, patentability cannot be found. The instant disclosure does not set forth evidence ascribing unexpected results due to the claimed dimensions. See *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338 (Fed. Cir. 1984), which held that the dimensional limitations failed to point out a feature which performed and operated any differently from the prior art.

As for claim 4, the prior art combined device shows the co-fired aluminum nitride substrate carrying the light emitting device has a surface roughness of 0.1  $\mu\text{m}$  Ra or less (Hikasa: Col. 7, lines 55).

As for claim 5, the prior art combined device shows the light emitting device is mounted on the co-fired aluminum nitride substrate through a metal bump 44 (Hsing Chen: Figs. 12 and 1E).

As for claim 9, the prior art combined device shows the vapor-deposited metal film is deposited via a chemical vapor deposition method or a sputtering method.

Regarding the process limitations ("deposited via a chemical vapor deposition method or a sputtering method"), these would not carry patentable weight in this claim drawn to a structure, because distinct structure is not necessarily produced.

Note that a "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Brown*,

173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and *In re Marosi et al.*, 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that the applicant has the burden of proof in such cases, as the above case law makes clear.

As for claim 10, the prior art combined device shows a maximum current quantity applicable to said apparatus is 1100 to 2000 mA.

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

As for claim 11, the prior art combined device shows a blue LED chip as the light emitting device and a yellow phosphor 1084, wherein said blue LED chip is mounted on the co-fired aluminum nitride substrate and said yellow phosphor is mounted so as to cover the mounted blue LED chip (Hsing Chen: [0061], lines 11-15).

8. Claim 3, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsing Chen et al. (2004/0188696), Hikasa et al. (5,770,821) and Lee



et al. (2004/0262738), as applied to claim 1 above, in view of Nakabayashi et al. (2002/0167017).

Hsing Chen et al., Hikasa et al., and Lee et al. disclosed substantially the entire claimed invention, as applied to claim 1 above, including a LED chip as the light emitting device (Hsing Chen: [0059], line7).

Hsing Chen et al., Hikasa et al. and Lee et al. do not disclose at least one peripheral component arranged on the co-fired aluminum nitride substrate, wherein the at least one peripheral component is selected from the group consisting of a thermistor, a resistor, and a diode for inhibiting reverse current.

Nakabayashi et al. teach in Fig. 6 and related text at least one peripheral component 135 arranged on the substrate, wherein the at least one peripheral component is selected from the group consisting of a thermistor, a resistor, and a diode for inhibiting reverse current ([0086], line 17).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to include at least one peripheral component selected from the group consisting of a thermistor, a resistor, and a diode for inhibiting reverse current, as taught by Nakabayashi et al., in Hsing Chen et al., Hikasa et al. and Lee et al.'s device, in order to prevent an accumulation of electrostatic charge in the device.

9. Claims 6 and 7, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsing Chen et al. (2004/0188696), Hikasa et al. (5,770,821) and Lee et al. (2004/0262738), as applied to claim 1 above, in view of Arai et al. (4,220,810).

Hsing Chen et al., Hikasa et al. and Lee et al. disclosed substantially the entire claimed invention, as applied to claim 1 above, except a white resist film is arranged on an exposed front surface of the co-fired aluminum nitride substrate other than a region where the vapor-deposited metal film is arranged, wherein the resist film comprises a solder resist ink and is formed by screen printing method.

Regarding the process limitations ("formed by screen printed method"), these would not carry patentable weight in this claim drawn to a structure, because distinct structure is not necessarily produced.

Note that a "product by process" claim is directed to the product per se, no matter how actually made, *In re Hira*, 190 USPQ 15 at 17 (footnote 3). See also *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and *In re Marosi et al.*, 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that the applicant has the burden of proof in such cases, as the above case law makes clear.

Arai et al. teach in Fig. 3 and related text a white resist film 13 is arranged on an exposed front surface of the substrate other than a region where the vapor-deposited metal film is arranged, wherein the resist film comprises a solder resist ink and is formed by screen printing method (Col. 2, lines 6-65).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to include the white resist film, as taught by Arai et al., in Hsing Chen et al., Hikasa et al. and Lee et al.'s device, in order to prevent solder bridging, to reduce solder pickup, to eliminate the oxidation or corrosion of metallization pattern and the electromigration, and to protect the substrate at the time of assembling.

### ***Response to Arguments***

10. Applicant's arguments filed on October 1, 2009 have been fully considered but they are not persuasive.

Applicant argues that the "interpretation of claim 1 by the office is incorrect" and the Office's assertion that "the via holes of the light emitting device are arranged on the front surface of the co-fired aluminum nitride substrate" is mistake."

Claim 1 recited that "**a light emitting device** arranged on a front surface of the co-fired aluminum nitride substrate (lines 2-3); wherein **the light emitting device comprises** a vapor-deposited metal film and **via holes** (lines 7-8); the via holes penetrating the co-fired aluminum nitride substrate from the front surface, on which the light emitting device is arranged, to the rear surface of the co-fired aluminum nitride substrate ...". It is unclear how the via holes can penetrate from the front surface of the co-fired aluminum nitride substrate to the rear surface of the co-fired aluminum nitride substrate since the via holes are a part of the light emitting device. Therefore, the interpretation, "the via holes of the light emitting device", of claim 1, is correct, and claim 1 rejected under 112-2nd paragraph is proper.

11. Rest of applicant's arguments with respect to claims 1, 3-7 and 9-11 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MEIYA LI whose telephone number is (571)270-1572. The examiner can normally be reached on Monday-Friday 7:30AM-5:00PM Eastern Standard Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne Gurley can be reached on (571) 272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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1/7/2010